injection molded polymer thermoplastic material that has thermally conductive properties.

As amended, the method of the present invention provides for the formation of the part through the injection molding of a polymer ***thermoplastic*** base matrix loaded with ***thermally conductive*** fillers to provide a net shape molded part that is subsequently plated. The use of injection molding as the process to form the part enables complex geometries to be formed directly and integrally within the part. For example, as shown in the figures, complex channels 11 can be easily formed to suit the application requirements at hand. Such injection molding results in a net-shape molded part that does not require any further processing. In contrast, the laid-up formation of the part in Miller requires expensive and time consuming machining in order to form the part into a configuration suitable for use. The Miller disclosure describes the use of epoxy resins. By their nature, epoxy resins require catalysts to activate and cure the base resin, converting the material chemically from a fluid to a solid state. This material by its nature is not suitable for injection molding. Further, the only methods disclosed for injection molding relate to the formation of a structural foam core that does not include any filler load.

Examiner asserts that Miller discloses the use of an epoxy resin as a well-known polymer matrix. The present claims, as amended, disclose the use of a thermoplastic resin that is injection moldable. The thermoplastic materials are not simply interchangeable with epoxy resins as asserted by the Examiner. Further, the Examiner states the Miller disclosure presents the use of Kevlar® fiber which is well known for its thermally conductive properties. However, Miller is completely devoid of such a teaching. In fact, Kevlar® is a thermal insulator with high tensile strength qualities. Not surprisingly, the Assignee of the Miller reference is the United States Air Force, who is interested in an impact resistant outer casing for military applications. See Col.7, lines 5-13 and Col. 8, lines 15-18. The Applicant has enclosed printed pages from Dupont's web pages describing the inherent properties of its proprietary Kevlar® fiber. Within the list of properties there is no mention of Kevlar® being well known for thermal conductivity. In fact, Dupont markets their Kevlar® fibers in many forms including heavy weight gloves formed from Kevlar® fibers that are rated to protect the user from handling materials in excess of 900°F. If the fibers were well known for their highly thermally

conductive properties, they would burn the wearer of the gloves, not protect the wearer. Miller teaches an assembly which is completely different than the device taught and claimed by the Applicant. Miller teaches a chassis for housing electronic components, while the Applicant's invention is specifically a heat transfer and dissipation device. Claim 9 has been amended accordingly to claim a heat dissipation part that has a contact surface for communicating with a heat-generating object for transferring heat therefrom.

Since Miller fails to teach net-shape injection molding of a heat transfer part, the use of thermoplastic resins and the use of thermally conductive fibers, it cannot anticipate the Applicant's claimed invention as amended. Clearly, the present invention discloses elements that are not shown or disclosed in the cited references, therefore, rendering the Examiner's rejection under §102 inapplicable.

II. CONCLUSION

Accordingly, claims 9 and 10 are believed to be in condition for allowance and the application ready for issue.

Corresponding action is respectfully solicited.

PTO is authorized to charge any additional fees incurred as a result of the filing hereof or credit any overpayment to our account #02-0900.

Respectfully submitted,

1/10/03

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ATTACHMENT A

Claims with markings to show changes made.

9. (Twice Amended) A method of forming a thermally conductive part for dissipating heat away from a heat generating object, comprising the steps of:

providing a base thermoplastic polymer matrix;

mixing a thermally conductive filler material into said base thermoplastic polymer matrix to form a thermally conductive composite material;

injection molding a part [of a] from said thermally conductive composite material into a net shape molded configuration [, said composite material including a polymer base matrix with a thermally conductive filler material loaded therein; and]

providing a contact surface for flush thermal communication with a heat generating object; and

applying a metallic coating over said part.